

Unit 12 – The Dynamic Earth (Ch. 17) and Plate Tectonics (Ch.18)**Chapter 17.1 – Structure of the Earth**

1. The Earth is made up of four layers: the _____, the _____, the _____, and the _____.
2. The outermost core, the _____, is made from solid, brittle rock. Continental crust is made of _____ rock than ocean crust; however continental crust can be as thick as _____ km.
3. The thickest layer of Earth's four layers is the _____ and it is approximately _____ km thick. This layer is divided into two sections: the _____, which has slow flowing magma, and the _____, which is made of solid, dense rock containing magnesium and _____. The crust and outer mantle make up the _____. Just below the lithosphere is the _____ which behaves like a _____ fluid.
4. Unlike the other layers of Earth, the _____ is made of liquid iron and nickel. The inner core however is made of very dense _____.
5. How can scientists examine volcanoes to directly observe the Earth's interior?
6. Provide two indirect observations scientists use to make suggestions about the structures and processes underground.
7. Scientists study the _____ of earthquakes to investigate the structure of the Earth. The _____ and _____ of the waves change as the waves travel through different types of _____.

8. Name three technologies we have used to enhance our mapping abilities.

Chapter 17.2 – Evidence of a Dynamic Earth

1. The lithosphere is composed of many _____. As they move past, over or under each other, they cause _____, _____, and _____.
2. Provide five different clues or pieces of evidence that supported the idea that all the continents used to be joined together as one large continent.
3. _____ first proposed from all this evidence the _____ theory.
4. Wegener noticed some similarities with fossils on different continents. Explain how the sharp-toothed, freshwater reptile called Mesosaurus was especially intriguing in supporting the idea of a supercontinent.
5. Further supporting evidence of continental drift are geological features such as _____ chains and _____ flows that line up across continents separated by miles and miles of ocean water.
6. Glaciers provide distinctive patterns as they pass over rock. This provides us with evidence of _____. Some believe this is because the continents drifted, however it may simply be due to a change in Earth's _____.
7. Skeptics to the continental drift theory were not convinced as many people used to believe the Earth was only _____ years to _____ years old. However, we have since used radioactive dating to determine that the rough age of the Earth is over _____ million years old.

Chapter 17.3 – New Evidence of a Dynamic Earth

1. Prior to World War II, there was a belief that the ocean floor was _____ and undisturbed. However, Harry Hess helped lead us to the discovery that trenches and _____ ridges are all along the ocean floor.
2. What is sea floor spreading and how is it related to ocean trenches?
3. Where does the heat come from that is found near the Earth's core?
4. One of the ways that scientists have confirmed that the sea floor is older the further it is from a ridge is through the use of _____ dating.
5. How has Earth's magnetic field further supported the concept of sea floor spreading?
6. Radioactive dating of ocean floor rock, patterns of magnetic stripping of rock near ridges, and radioactive decay have led to today's knowledge that the _____ is in motion.

Chapter 17.4 – Theory of Plate Tectonics

1. The theory of plate tectonics states that the lithosphere is divided into _____ major plates and approximately _____ smaller ones. The plates themselves float on the more dense, fluid-like _____. These plates all meet at three types of boundaries: _____, _____, and _____.
2. At divergent plate boundaries, plates are _____ from each other forming valleys or _____. Diverging plates can cause increased _____ activity, as well as earthquakes.

3. Right below the lithosphere is the _____, a partly molten layer in the upper mantle. In this layer the _____ varies partly due to _____ decay that heats up the _____ in spots where _____ such as uranium occur.
4. Mantle _____ occurs as hotter, less dense material in the mantle _____, cools and then _____ again, only to be reheated. Mantle convection is one of the major driving forces behind _____ movement.
5. Rising currents of magma that occur in the ocean are called _____. If these rising current occur on land they are called _____.
6. What are the three major types of plate convergence?
7. Describe what occurs during oceanic-continental plate convergence.
8. When two oceanic plates converge, _____ often form and when two _____ plates converge, _____ often form.
9. At a transform boundary, plates move past each in _____ directions. At these boundaries we often observe _____ faults and since the passing of these plates is not a smooth process _____ commonly occur.

Chapter 18.1 – Causes and Effects of Plate Movement

1. _____ occurs as hotter, less dense material in the mantle _____, cools and then _____ again, only to be reheated. Mantle convection is one of the major driving forces behind _____ movement.
2. Describe the process known as ridge push and how it is related to plate movement.

3. Explain how slab pull contributes to keeping plates in motion.
4. Mountains are formed either when an oceanic plate converges with a _____ plate, or when two _____ plates converge.
5. Why are fossils of marine organisms found high up in the Rockies?
6. Along divergent boundaries, _____ rises to the surface from the mantle. Both earthquakes and _____ often occur along rifts. When these boundaries cross the thicker lithosphere of a continent, blocks of the crust _____ as the crust stretches apart, and _____ often form.
7. How are trenches formed on the ocean floor?

Chapter 18.2 – Geological Events

1. A _____ in the lithosphere where magma rises and reaches the Earth's surface is called a _____.
2. What three things help lower the melting point of rock in the asthenosphere and thus turn it into molten rock (magma)?
3. The stress in the lithosphere created by the moving tectonic plates, creates _____ and _____, which then leads to _____ rising to the surface.
4. Small regions of very hot mantle are called _____. At these regions, magma rises to the surface forming chains of _____.

5. What are volcanic belts and volcanic islands arcs?
6. Earthquakes are _____ through the Earth's crust caused by volcanoes and plate movement. These plates do not move smoothly and earthquakes occur at all types of plate _____. Friction causes the plates to stick together and forces to _____. Eventually, the built up forces overcome the friction and the plates _____ ahead.
7. The location inside the Earth where an earthquake originates is called the _____. The point on the Earth's surface directly above the location inside the Earth where an earthquake originates is called the _____.
8. Earthquakes are categorized into what three headings?
9. There are two types of seismic waves: _____ and _____.
10. Describe primary, secondary and surface waves. Be sure to name the type of wave, how quickly it arrives, the size of the wave, and how it travels where applicable.
11. Scientists use _____ to detect earthquake waves. These devices help us determine the location of the _____.

Vocabulary to Know

Write a concise definition of each of these terms found in this chapter.

Asthenosphere –

Body wave –

Continental Drift Theory –

Converging boundary –

Crust –

Diverging boundary –

Earthquake –

Epicentre –

Focus –

Hot spot –

Inner core –

Lithosphere –

Magnetic stripping –

Mantle –

Mantle convection –

Mid-ocean ridge –

Ocean trench –

Outer core –

Paleoglaciation –

Plate tectonic theory –

Primary waves –

Ridge push –

Rift valley –

Sea-floor spreading –

Secondary waves –

Slab pull –

Spreading ridge –

Strike-slip fault –

Subduction zone –

Surface waves –

Tectonic plate –

Transform boundary –

Volcanic belt –

Volcanic island arc –

Volcano –